

Congress of the United States

House of Representatives

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

2321 RAYBURN HOUSE OFFICE BUILDING

WASHINGTON, DC 20515-6301

(202) 225-6371
www.science.house.gov

MEMORANDUM

TO: Committee on Science, Space, and Technology Members and Staff
FROM: Committee on Science, Space, and Technology Staff
DATE: July 18, 2013
RE: Full Committee Markup

The Committee on Science, Space, and Technology will meet on **Thursday, July 18, at 9:15 a.m.** in Room 2318 of the Rayburn House Office Building to consider the following:

- **H.R. 2687, the “National Aeronautics and Space Administration Authorization Act of 2013”**

BACKGROUND AND NEED

The National Research Council’s report *NASA’s Strategic Direction and the Need for a National Consensus* issued in December 2012 provides context and summarizes the need for the reauthorization.

“Despite NASA’s broad portfolio that spans human spaceflight, space and Earth science, and aeronautics research, in the public mind the agency is most closely associated with human spaceflight. In 2004, after many years of uncertainty about the futures of the space shuttle and the ISS, President George W. Bush announced a ‘Vision for Space Exploration’ that called for astronauts to return to the Moon by 2020 and someday to go to Mars. Similar goals had been expressed by President George H.W. Bush in 1989, but they did not receive bipartisan support, and the President’s proposed budgets for achieving these goals were rejected. By 1992, the goals were essentially abandoned.

The 2004 Vision announcement followed by almost exactly a year the space shuttle Columbia tragedy that cost the lives of seven astronauts. The Columbia Accident Investigation Board noted in its report that if astronauts lives were to be at risk through space exploration, the rationale and goals needed to be better defined.

President George W. Bush did not propose adding significant funding to NASA's budget to accomplish the new goals, however. Instead, his plan was to terminate the space shuttle program in 2010 after completing construction of the ISS and to end U.S. involvement in the ISS in the 2015-2016 timeframe. The space shuttle and ISS funds would be redirected to achieving the Moon/Mars goals.

In 2005, a Republican-controlled Congress passed the 2005 NASA Authorization Act, which supported President Bush's Moon/Mars program while also stressing the need for adequate utilization of the ISS and holding open the possibility of continuing the space shuttle program beyond 2010. Three years later, a Democratic-controlled Congress passed the 2008 NASA Authorization Act that was similar to the 2005 act. At that point in time, Congress and the White House, Democrats and Republicans, were all in general agreement about the future of the human spaceflight program. NASA pursued the presidential and congressional policies by initiating the Constellation program to build capabilities to send people back to the Moon and to Mars, including new launch vehicles and spacecraft.

In January 2009, President Barack Obama convened a special committee to look at the human spaceflight program and offer options. Chaired by Norman Augustine, the committee concluded that there were "technical and budgetary issues" in major components of the Constellation program (e.g., Ares I, Orion) that were creating considerable schedule delays. Independent analyses showed that "the length of the gap in U.S. ability to launch astronauts into space [would] be at least seven years." The Augustine committee concluded further that in order for NASA to pursue a mission of sending humans beyond low Earth orbit (LEO), NASA required additional funding of \$3 billion more per year. [The NRC report did not note, however, that the Administration also slashed funding for Exploration Systems in the FY10 budget request¹]

In February 2010, as part of the fiscal year (FY) 2011 budget request, the White House proposed terminating the Constellation program and replacing it with a NASA effort to develop technologies for human exploration beyond LEO. No decision on what kind of vehicles to build would be made until at least 2015, and no specific destination or timeframe for human expeditions beyond LEO was included.

Meanwhile, the President decided that instead of NASA developing a replacement capability for the space shuttle to ferry astronauts to and from the ISS, NASA would build on its Commercial Orbital Transportation Services (COTS) partnership agreements with U.S. industry, initiated in 2006. This approach would enable them to contract for the development of "commercial crew" space transportation systems, where NASA would help pay companies to develop their own space transportation systems, and the companies would invest significant

¹ [http://www.nasa.gov/pdf/345955main_8_Exploration %20FY 2010 UPDATED_final.pdf](http://www.nasa.gov/pdf/345955main_8_Exploration_%20FY%202010_UPDATED_final.pdf)

amounts of their own money toward development with the expectation of the emergence of a private human spaceflight market.

Congress also wanted a destination and a timetable for sending astronauts beyond LEO. In April 2010, the President announced his goals of sending astronauts to an asteroid by 2025 and to orbit Mars in the 2030s. These goals were officially expressed in the 2010 National Space Policy issued by the White House two months later.

The totality of the decisions to proceed with President Bush's plan to terminate the space shuttle, but to also end the Constellation program that was developing a replacement U.S. crew transportation capability, resulted in programmatic disruptions. These decisions also resulted in an indefinite extension of the number of years the United States would need to depend on Russia to take NASA astronauts to and from the ISS. In addition, the decisions to rely on the commercial sector to build a new U.S. crew space transportation system, when some were skeptical that the companies were technically ready to take on such a responsibility, and the decision to replace the Moon with an unspecified asteroid as the next destination for human spaceflight, made without prior consultation and contravening two existing laws, were met with Congressional skepticism.

A number of influential members of Congress insisted that the government — NASA- build a new crew transportation system regardless of any commercial crew aspirations. Congress wanted a new large rocket reminiscent of the Saturn V used for the Apollo program to enable trips beyond LEO, whatever the destination, and to accelerate, as much as possible, restoring U.S. ability to launch people into space rather than relying on Russia for transport.

In October 2010, Congress and the White House reached a compromise in the 2010 NASA Authorization Act. In essence, the agreement was for NASA to do both what the White House and Congress wanted. NASA would proceed with the White House plan for commercial crew transport as well as Congress's plan for a NASA-developed Space Launch System (SLS), based heavily upon legacy systems such as those developed for the space shuttle program, and an Orion spacecraft that would take humans beyond LEO and serve as a backup in case the commercial systems did not materialize.

The budget outlook for NASA, meanwhile, worsened. The President had planned to add \$6 billion to NASA's budget over 5 years when he announced his new plan in the FY2011 budget request. A year later, with Republicans regaining control of the House and deficit-reduction becoming the dominant political theme, NASA was hoping for level funding at best. Today, the same NASA that was deemed by the Augustine committee to be unable to afford the Constellation program now must fund Constellation's replacement SLS/Orion and also fund commercial crew transport. NASA still must find funds for a habitation and support module to enable long duration trips beyond LEO.

Some in Congress remain wary of the administration's plans, stating that budget requests since the 2010 NASA Authorization Act have favored spending on commercial crew rather than SLS/Orion. NASA also took longer than expected to choose an SLS design, prompting congressional criticism that the agency was delaying making a decision. All the while, support for the idea of sending astronauts to an asteroid failed to gain widespread support, and NASA has not undertaken any visible steps required to make such a mission possible. These issues, in part, led Congress to commission the current study to examine NASA's strategic direction.

The one piece of common ground is that sending humans to Mars remains the long-term goal for everyone involved in this debate. As shown in Box 1.1 [excluded], that has been the driving force in presidential policies and speeches for decades. The debate is about the steps between the ISS and Mars and when we will get there, dictated largely by budget constraints."

In addition to the background outlined by the National Research Council report, the Budget Control Act of 2011 also provides important context for this year's NASA authorization. This Act required across the board rescissions and spending caps in the event that an agreement on deficit reduction was not reached. The Budget Control Act of 2011 passed the House and Senate with broad bipartisan support (including many senior members of the Science, Space, and Technology Committee) and was signed by the President. Unfortunately, an agreement was never met on mandatory spending, necessitating reductions in funding levels for discretionary spending. The Authorization bill before the Committee reflects funding levels commensurate with that Act.

MAJOR PROVISIONS

This bill authorizes programs and projects at the National Aeronautics and Space Administration for two years. Proposed NASA funding is consistent with the Budget Control Act and FY2013 appropriations--\$16,865,200,000. If the House and Senate agree to repeal and replace the BCA, then funding would be added to the International Space Station, Space Launch System, Orion, and Commercial Crew. NASA continues to be the world's premier space organization. This bill seeks to ensure sustainability of purpose and budget for high-priority programs.

Human Spaceflight: Building on the themes of previous authorizations, this legislation reaffirms Congress's commitment to space exploration, both human and robotic, using a "go-as-we-can-afford-to-pay" strategy toward NASA's missions. This bill makes clear that missions to lunar orbit, the surface of the Moon, and Mars are the goals for NASA's human spaceflight program with quadrennial reports for what progress has been made toward those goals.

In the near-term, the primary objectives for NASA human spaceflight include:

- Realizing the research potential of the International Space Station with an Office of Science & Technology Policy-led strategic plan for all science agencies to conduct research on the Station. NASA will study the feasibility of continuing its operational lifespan beyond 2020.

- Continued commitment to develop the Space Launch System and Orion Crew Vehicle to return to the Moon and beyond, but no funding for an asteroid rendezvous mission. Ability to use Orion as a backup system to support the Space Station if necessary.
- Building Commercial Crew systems (with NASA funds) to launch American astronauts on American rockets from American soil as soon as possible, so we are no longer reliant on Russia.

Science Programs: Relying on the guidance of National Academy of Sciences Decadal Surveys, this bill restores balance to NASA's science portfolio. NASA Earth Science is reduced to 2008 spending levels to provide better balance of funding for NASA's planetary science programs. Thirteen different federal agencies fund \$2.5 billion annually in climate science research, but only NASA has space exploration as its primary mission. NASA is still involved in weather-related and climate change research—spending \$1.2 billion annually. NASA must remain focused on building weather satellites for NOAA to meet our nation's urgent weather-monitoring needs, as well as building LANDSAT satellites for the US Geological Survey.

- Maintains launch date of the James Webb Space Telescope by 2018.
- Funds survey for potentially-hazardous Earth-crossing asteroids.
- Continues exciting search for planets around other stars and life on other worlds.

Aeronautics: NASA's aeronautics research program is important for the safe integration of unmanned aerial systems into the national airspace as well as NextGen technology for air traffic management.

STEM Education: There is bipartisan consensus that the Administration's proposal to re-organize NASA's STEM education program is questionable. This bill maintains FY 2013 organization and funding level.

NASA Leadership: Witnesses have raised concerns that NASA has been too politicized in recent years, adversely affecting the success of NASA's programs. This bill would make the following changes: Similar to the National Science Foundation, the NASA Administrator would be appointed to a 6-year term appointment. The NASA Advisory Council would be structured to provide more stakeholder input, with appointments by both the Congress and the President.

Space Act Agreements: The bill provides greater public accountability and transparency on Space Act Agreements (SAAs).

Controlling Costs: The bill requires NASA to enforce more cost estimating discipline for its programs, while restoring funds set aside for contract termination liability toward development work on high-priority programs.

LEGISLATIVE HISTORY

The National Aeronautics and Space Administration (NASA) was created in 1958 with by President Dwight Eisenhower and Congress through the National Aeronautics and Space Act of

1958 (Public Law 85-568). Since the year 2000, NASA has been reauthorized by Congress four times including in 2000, 2005, 2008, and 2010.

While the length of the authorizations varies, recent bills have included short periods to increase congressional oversight and accountability for the agency. The 2008 and 2010 bills were two and three year authorizations respectively. The 2010 Act expires on December 31, 2013; therefore, NASA must be reauthorized by that time.

In preparation for this legislation, the Committee held several hearings since the last authorization to gain input from the expertise of scientists, mission planners, industry, and NASA. The Committee held hearings on the following topics: strategic vision for the agency; the future of human exploration; the Space Launch System and Orion crew capsule; the Commercial Crew and Cargo programs; research opportunities and utilization of the International Space Station; the suborbital vehicles research market; the national launch indemnification regime; near earth object tracking and mitigation; the leadership and management of NASA; and space weather and its implications on space assets.

The full committee and subcommittee have heard from the Administrator as well as the leadership of various mission directorates. Additionally, the committee held a legislative hearing on a discussion draft prior to the subcommittee mark up with expert witnesses.

On July 10, 2013, the Subcommittee on Space met to consider the “National Aeronautics and Space Administration Authorization Act of 2013.” The Committee Print was favorably reported to the full Committee.

AUTHORIZATION

The bill authorizes NASA at \$16,865,200,000 annually for two years, fiscal year 2014 and fiscal year 2015. This funding is broken down as follows:

- Science: \$4,626,900,000
 - Planetary Science: \$1,500,000,000
 - Earth Science: \$1,200,000,000
 - Astrophysics: \$643,300,000
 - Heliophysics: \$626,400,000
 - James Webb Space Telescope: \$658,200,000
- Aeronautics: \$565,700,000
- Space Exploration: \$4,007,000,000
 - Space Launch System: \$1,802,400,000
 - Orion Crew Capsule: \$1,200,000,000
 - Exploration Research and Development: \$305,000,000
 - Commercial Crew: \$700,000,000
- Space Technology: \$500,000,000
- Space Operations: \$3,817,900,000
 - ISS program: \$2,984,100,000
 - Space and Flight Support: \$833,800,000

- Education: \$125,000,000
- Cross Agency Support: \$2,600,000,000
 - Center Management and Operations: \$2,000,000,000
 - Agency Management and Operations: \$600,000,000
- Construction and Environmental Compliance: \$587,000,000
 - Construction of Facilities: \$542,000,000
 - Environmental Compliance & Restoration: \$45,000,000
- Inspector General: \$35,300,000